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Study on engaging indigenous peoples more inclusively in the disaster risk reduction process

Note by the secretariat

Pursuant to a decision of the Permanent Forum on Indigenous Issues at its tenth session (see E/2011/43 and Corr.1, para. 97), Paimaneh Hasteh, a member of the Forum, undertook a study on increasing the inclusion of indigenous peoples in the disaster risk reduction process, in particular by respecting the linguistic and cultural practices of indigenous peoples at risk. The study is hereby submitted to the Forum at its twelfth session. The study is co-authored by Mirna Cunningham, a member of the Forum.

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Study on engaging indigenous peoples more inclusively in the disaster risk reduction process[1]

Summary

Indigenous peoples have suffered from the imposition of development models that have devastated their communities, and these communities are now at risk. While it is common to see indigenous leaders plan and anticipate ways to take advantage of the opportunities made possible by the assets and the dynamic energy of a community, it is less often that they seriously consider potential risks.

The present study is intended to stimulate discussion and act as a catalyst for creating opportunities for sharing experiences and knowledge about disaster risk reduction among indigenous peoples and their communities in nations throughout the world. It should also serve to generate debate, raise questions and find solutions that will result in the reduction of loss of life and property, and the restoration of the environmental, social, cultural and spiritual balance in communities affected by disasters. In addition, the study will highlight current efforts that, while not originally designed with indigenous peoples in mind, may be useful to indigenous community leaders as they look for opportunities to reduce risks and plan appropriate response strategies to mitigate adverse environmental, economic, social, cultural or spiritual impacts.

It is also intended that the issues articulated by indigenous peoples themselves will be considered in the planning and outcomes of the fourth session of the Global Platform for Disaster Risk Reduction in 2013, the United Nations World Conference on Indigenous Peoples in 2014 and the third World Conference on Disaster Risk Reduction in 2015.

[1] The authors wish to acknowledge invaluable assistance in drafting of the present report: John C. Scott, Daniel Cabello Llamas and Patricia Bittner from the Center for Public Service Communications and Dennis Mairena from the Center for Autonomy and Development of Indigenous Peoples.

I. Introduction

1. Recently, two urban Native American focus groups in Seattle, Washington State, United States of America, were asked to offer feedback on public health practices surrounding the influenza A (H1N1) crisis. Responders expressed confusion with regard to different public health messages about the severity of the problem and the safety of the vaccine being offered. The lack of a clear and authoritative message reinforced an already historical distrust of public officials, causing those involved in the two focus groups to question whether the advice being offered was valid. The sheer number of messages from different sources, each asking that their views be seen as correct, exacerbated the confusion and prevented some from seeking the vaccine.[2] This limited assessment raises questions about the importance of early warning messaging and its value to indigenous peoples and their communities, which must not be overlooked in times of real crisis, including disasters and public health emergencies.

2. Indigenous peoples, who comprise an estimated 370 million in some 90 countries throughout the world,[3] face systematic discrimination and exclusion from political and economic power and continue to be overrepresented among the poorest and illiterate sectors of society. Indigenous peoples are often dispossessed of their ancestral lands and deprived of their resources for survival, both physical and cultural, further weakening their capacity to deal with hazards, both natural and man-made.

3. However, literacy and language, important as they are, are only one aspect of risk reduction activities within indigenous peoples' communities. With respect to disaster preparedness, mitigation, prevention and longer term risk reduction objectives, community leaders and disaster managers may have an opportunity to take advantage of local time-tested practices, drawn from the close relationship of indigenous peoples with the environment, their cultural beliefs and the pool of common sense within the community, by including these biases in their planning. Ideally, bridge-building of this kind would take place in collaboration with respected community leaders through participatory capacity assessment and horizontal planning rather than imposed top-down processes. Communities must be involved in outlining their own disaster risk reduction strategies.[4] It is important to respect the culture of affected communities because effective means of successful disaster risk reduction planning cannot be built without engaging the people themselves and ensuring that the strategies agreed upon remain their own.[5]

4. Understanding different cultural beliefs and ways of life within communities, in particular within indigenous communities, which filter mainstream messages through their own historical context, is a key factor to success for community leaders and disaster professionals working to reduce the impact of natural hazards.

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[2] R. Forquera, Seattle Indian Health Board, personal communication, 12 October 2010.

[3] http://www.un.org/esa/socdev/unpfii/documents/SOWIP_web.pdf, accessed on 6/12/2012.

[4] Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, the wise management of land and the environment and improved preparedness for adverse events.

[5] Instituto de Investigación y Desarrollo, Centro para la Autonomia y Desarrollo de los pueblos Indígenas, CADPI, *Cambio climático: medidas de adaptación en comunidades de las Regiones Autónomas de la Costa Caribe de Nicaragua*, febrero 2010.

5. Assessments of indigenous communities must not be limited to attempts to understand how outside messages and practices are perceived and responded to however — local capacities, resources and knowledge must be appraised and capitalized on. For example, during the Indian Ocean tsunami of 2004, the indigenous inhabitants of Simeulue Island, Indonesia, managed to survive the catastrophe in spite of being only 40 kilometres from the epicentre of the earthquake. While the tsunami killed well over 200,000 people in the rest of Indonesia, only seven of the 78,000 members of the community died during the disaster.[6]

6. Barely 10 minutes after the earthquake, waves 10 metres high hit the island. In that scenario, when even a high-technology early warning system with a 15-minute response time would have been useless,[7] the knowledge, passed from generation to generation, that buffaloes run to the hills when a tsunami is coming was effective.[8] In another case, inhabitants of the Damodar River in West Bengal, India, used markers inscribed on trees and the observation of ants moving their eggs to higher ground as a warning against floods.[9]

7. For millennia, local capacity, practices, knowledge and traditions have helped indigenous peoples, who have developed a close relationship with their natural environment, to cope with hazards and thrive in highly at risk areas. In many cases, however, the loss of such practices due to social, political or economical changes have increased the vulnerability of such populations, and this problem has increased with the advance of climate change. There is clearly a need to research and document traditional risk reduction and mitigation practices in order to determine how they can be incorporated, or reincorporated, into local communities and onto national planning as well as to promote intergenerational dialogue among indigenous organizations and communities. Through participative assessments of both capacities and vulnerabilities and through policymaking processes aimed at combining local knowledge with scientific methods, indigenous peoples can take advantage of their own traditional knowledge to develop integrated strategies that are institutionalized and perhaps even transferred to similar contexts elsewhere.

II. Background

8. Disasters affect populations and ecosystems differently, depending on factors such as unsustainable development practices, ecosystem degradation, poverty and climatic variability and extremes. The increase in the number both of natural and man-made disaster risks in recent years poses a threat to lives and to development efforts. Disaster risk reduction involves the process of identifying, assessing and reducing the effects of such events.

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[6] Baumwoll, Jennifer, "The value of indigenous knowledge for disaster risk reduction: A unique assessment tool for reducing community vulnerability to natural disasters", Webster University, Vienna, March 2008.

[7] McAdoo, Brian G., et al, "*Smong*: How an oral history saved thousands on Indonesia's Simeulue Island during the December 2004 and March 2005 tsunamis", *Earthquake Spectra* (2006).

[8] See Villagran de León, Juan Carlos; Bogardi, Janos; Dannemann, Stefanie; and Basher, Reid, "Early Warning Systems in the Context of Disaster Risk Management", Bonn, United Nations University, Institute for Environment and Human Security, 2006.

[9] See Schware, R., "Flood information systems: Needs and improvements in Eastern India", *Environmental Management*, Vol. 8, Issue 1.

9. Indigenous peoples around the world have used their traditional knowledge, the methods and practices that originate within their communities and are maintained and disseminated through non-formal means developed over several generations, to prepare for, cope with and survive disasters over the millennia.

10. In contrast, within formalized information on disaster risk reduction such as plans, vulnerability maps and even legislation and law, which are typically prepared by national or subnational organizational structures, many of which are dominated by non-indigenous decision makers, indigenous peoples often do not have adequate opportunities to participate in the design, implementation, monitoring and evaluation processes. The United Nations Declaration on the Rights of Indigenous Peoples, article 19 of which states that "States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free, prior and informed consent before adopting and implementing administrative measures that may affect them", presents an opportunity to assure their participation in the determination of disaster risk reduction programmes and policies.

11. In recent years, humanitarian efforts in the field of natural disasters have focused more on preparedness than relief. This has occurred within the context of understanding and appreciating the increasing vulnerability of disaster-prone developing countries and the ever-growing impact of natural hazards on livelihoods.[10] In spite of advances in technology and increased investment in disaster management, the toll of disasters continues to rise.[11] The cause of this is not only the obvious divergence between policy and practice, but also the changes in people's social, economic, cultural, political and environmental contexts.[12] The imposition of western models in societies that have lived with, adapted to and coped with a constant and wide range of natural hazards for several millennia, and nevertheless prospered, can result in a loss of indigenous knowledge.[13] This may be one of the most important factors contributing to the increase in vulnerability of such societies.

12. Until recently, the vast body of indigenous knowledge had been largely ignored or discarded by non-indigenous policymakers, whose orientation and focus tends to be on western science and technology-based methods of disaster risk reduction and emergency response.

International context

13. The Hyogo Framework for Action 2005-2015, adopted at the World Building Conference on Disaster Reduction in 2005, guides national policies and international

[10] See Dekens, J, *Local Knowledge for Disaster Preparedness: a Literature Review*, Kathmandu, International Centre for Integrated Mountain Development, 2007.

[11] See Shaw, Rajib; Sharma, Anshu; Takeuchi, Yukiko; Uy, Noralene, *Indigenous Knowledge and Disaster Risk Reduction*, policy note, Graduate School of Global Environmental Studies, Kyoto University, 2009.

[12] See Mercer, J., Kelman, I., Suchet-Pearson, S., and Lloyd, K., "Integrating indigenous and scientific knowledge bases for disaster risk reduction in Papua New Guinea", *Geografiska Annaler: Series B, Human Geography*, 2009, m. 91, No. 2.

[13] See Campbell, J. R., "Traditional disaster reduction in Pacific Island Communities", *GNS Science Report* 2006/038.

organizations in their efforts to reduce losses stemming from natural hazards. The Framework is comprehensive and addresses the roles of States and regional and international organizations, calling on civil society, academia, volunteer organizations and the private sector to combine efforts to promote disaster reduction, including through the decentralization of authority and the provision of resources to promote action at the local level. The Framework thus presents an opportunity to include local indigenous governments and institutions.

14. The Hyogo Framework is intended to promote action to substantively reduce disaster losses, including loss of life and loss of the social, economic and environmental assets of communities and countries. The five priorities for action are:

(a) Ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation;

(b) Identify, assess and monitor disaster risks and enhance early warning;

(c) Use knowledge, innovation and education to build a culture of safety and resilience at all levels;

(d) Reduce the underlying risk factors;

(e) Strengthen disaster preparedness for effective response at all levels.

15. The United Nations Office for Disaster Risk Reduction (UNISDR) acts as the focal point within the United Nations system for the coordination of disaster risk reduction in order to ensure synergies among disaster risk reduction activities. The Office leads inter-agency country-specific and thematic discussions and contributes to the development of United Nations programming tools, such as guidelines on risk reduction.

16. The first session of the Global Platform for Disaster Risk Reduction took place in 2007, and since then, the Office has held the event every two years. The Global Platform is a forum for information exchange, discussion of the latest developments and knowledge and partnership-building across sectors, with the goal of improving implementation of disaster risk reduction efforts through better communication and coordination among stakeholders. It offers the opportunity for Government representatives, non-governmental organizations, scientists, practitioners and United Nations organizations to share experiences and formulate strategic guidance and advice towards the implementation of the Hyogo Framework for Action. As the end date for implementation of the Framework approaches in 2015, the fourth session of the Global Platform, scheduled for May 2013, provides a unique opportunity to focus on issues related to indigenous peoples and disaster risk reduction. A series of online dialogues (see www.preventionweb.net/posthfa/dialogue) is currently under way, involving a wide range of stakeholders in the consultative process towards a post-2015 framework for disaster risk reduction.

17. Until recently, global focus on indigenous peoples' concerns, including efforts within the Hyogo Framework for Action, has been limited. It is important to take advantage of the present momentum and to ensure that indigenous peoples and their communities have access to best practices and lessons learned through the work of UNISDR and others, and that the experience and valuable knowledge of indigenous peoples' communities is shared with and recognized by the international community.

III. Understanding disaster risk

18. Populations in many parts of the world face the threat of disaster on a daily basis. Disaster risk varies by geographical region and by the natural hazards to which an area or a population is exposed, for example earthquakes, floods, cyclones, typhoons, hurricanes, volcanoes, drought, frost, hail and heavy snow, all of which have long been a concern of countries worldwide. Some of the factors that play a definitive role in disaster risk are well known to local authorities and are the target of risk reduction measures, while knowledge about others is still emerging and is the subject of increased research and advocacy efforts.

19. In its 2009 *Global Assessment Report on Disaster Risk Reduction*, UNISDR mentions three major factors discussed below, that individually and in combination drive disaster risk efforts, especially in impoverished communities.

A. Vulnerable livelihoods

20. The livelihoods of many rural people still depend on agriculture and on natural resources, and their access to subsistence necessities, including land, labour, fertilizers, irrigation facilities, infrastructure and financial services, is often heavily constrained.

21. Disaster losses affect huge numbers of people in poor rural areas, where traditional patterns of land distribution and tenure tend to discriminate against them. Often times they may only have access to marginal and unproductive land that is prone to flooding or that receives erratic or minimal rainfall. In many cases, and for various reasons, historical and economic, indigenous communities have often been relocated to such areas.

22. Rural livelihoods that depend on agriculture and other natural resources are vulnerable to even slight variations in weather and are thus particularly sensitive to climate change, which may lead to even lower agricultural productivity. Inadequate infrastructure, including housing, schools and other public buildings, which is too often a fact of rural life, is easily damaged in disasters. For example, the collapse of heavy earth walls led to the destruction of 329,579 houses in the 2005 Kashmir earthquake, while the lack of protection offered by wattle and daub and thatch houses contributed to the deaths of 140,000 people in the cyclone that hit Myanmar in 2008.

B. Ecosystem decline

23. The preservation of ecosystems and the resources they provide is essential for the survival of the planet. Worryingly, the exploitation of ecosystem resources is increasing at the same time as their finite supply is diminishing. People have modified ecosystems to increase the output of certain commodities, but such exploitation has led to unregulated behaviour, for example, the deforestation for agricultural purposes and the destruction of mangroves to create shrimp ponds. While such changes in the distribution of ecosystem commodities benefit specific commercial interests, the costs are often borne by poor urban and rural households and indigenous communities that have little input into decision-making and derive little benefit from the commercial activities.

24. In Peru for example, the opening of new roads down the eastern slopes of the Andes into the agricultural frontier has led to a marked increase in the number of reported landslides in that region since the 1980s.

25. Particular attention must be paid to climate change and its impact on increasing disaster risk. A UNISDR briefing note on strengthening climate change adaptation efforts through effective disaster risk reduction points to the fact that climate change leads to gradual changes in variables such as average temperature, sea level and the timing and amount of precipitation. Climate change also contributes to more frequent, severe and unpredictable hazards such as cyclones, floods and heat waves, what are referred to as "extreme weather events".[14] In this regard, an effective climate change adaptation strategy should be seen as: (a) adapting development to gradual changes in average temperature, sea level and precipitation; and (b) reducing and managing the risks associated with more frequent, severe and unpredictable extreme weather events. Isolation from mainstream research and derived "best practices" exacerbate the problems faced by indigenous communities which, even if they do not contribute to climate change, must deal with its effects.

C. Unplanned development

26. The world is undergoing the largest wave of urban growth in history. As of 2008, for the first time, more than half of the world's population was living in towns and cities. By 2030 this number will swell to almost 5 billion, with urban growth concentrated in Africa and Asia. While megacities have captured much public attention, most of the new growth will occur in smaller towns and cities, which have fewer resources to respond to the magnitude of this change.

27. According to the 2009 UNISDR *Global Assessment Report on Disaster Risk Reduction*, poor people in informal urban settlements face higher levels of risk on a daily basis. Cities in the developed world typically have under-5 mortality rates of less than 10 per 1,000 live births, but developing countries often have far higher rates. In Nairobi, for example, the under-5 mortality rate was 61.5 per 1,000 live births for the city as a whole in 2002, but approximately 150 per 1,000 in informal settlements.

28. By 2050, an estimated 80 per cent of the Earth's population will be living in urban areas. Many indigenous peoples throughout the world are also following suit. In the United States for example, nearly 67 per cent of those self-identifying themselves as Native Americans or Alaska Native either alone or in combination with another race were living in cities in 2000. This trend towards urbanization was first recognized among this population in 1970 and the percentage of indigenous peoples living in cities has grown steadily ever since.[2]

29. Evidence from Africa, Asia and Latin America shows that the inhabitants of informal settlements are increasingly at risk from weather-related hazards. While urbanization in and of itself tends to increase the intensity of run-off during storms, leading to heavy flooding, poor building standards and underinvestment in

[14] See Parry, M. L., Canziani, O. F., Palutikof, J. P., van der Linden, P. J., and Hanson, C. E., *Climate Change 2007: Impacts, Adaptation and Vulnerability*, Intergovernmental Panel on Climate Change, 2007.

infrastructure, for example, in maintaining drains, exacerbates the problem. In fact, many floods are caused as much by deficient or non-existent drainage, as by the intensity of rainfall itself. Like other groups struggling to make ends meet, indigenous communities undergo increased hardship as individuals and families migrate to cities in increasing numbers, looking for work, often ending up in already vulnerable neighbourhoods.

D. What can indigenous peoples expect from engaging in disaster risk reduction?

30. The implementation of effective disaster risk reduction strategies can make communities healthier, better educated, economically stronger, more reliable trading partners and more resilient to the effects of climate change over time.

31. Communities that proactively seek to reduce disaster risk as part of their sustainable development efforts can save lives and property in the event of disasters, with a dramatic reduction in fatalities and serious injuries. They may also benefit by:[15]

(a) Protected development gains and less diversion of resources to disaster response and recovery;

(b) Active citizen participation and local democracy;

(c) Increased investment in housing and other properties, in anticipation of fewer disaster losses;

(d) Increased investments in infrastructure, including retrofitting, renovation and renewal;

(e) Economic growth and employment;

(f) Balanced ecosystems, that foster provisioning and cultural ecosystem services such as fresh water and recreation;

(g) Overall better health and well-being;

(h) Improved education in safer schools.

E. The risk of not paying attention to disaster risk reduction

32. A single hazardous event can take a severe toll on lives and livelihoods. It can destroy social and economic infrastructure that may have taken years and fortunes to develop, and upon whose vitality a community depends. A single event can also severely disrupt community lifelines, the systems that provide food distribution, water supply, health care, transportation, waste disposal and communications locally and with the rest of the world. Disaster risks can increase or decrease over time according to a country's ability to reduce its vulnerability and strengthen its risk governance capacity. Ongoing monitoring and evaluation of existing plans and policies is therefore of paramount importance.

[15] See UNISDR, "Making Cities Resilient" campaign.

33. For indigenous community leaders, reducing disaster risk can be a legacy opportunity — an opportunity to improve social, cultural and economic conditions and leave communities more prosperous and secure.

F. Disaster risk reduction and sustainable development

34. Disaster risk reduction is an integral part of sustainable development and of making communities resilient to disasters. A UNISDR handbook[16] points to social and environmental factors that help local government leaders to achieve resilience:

(a) Social factors:

(i) Guarantee access to basic services for all and provide post-disaster safety nets;

(ii) Allocate safe land for all strategic activities and housing;

(iii) Encourage multi-stakeholder participation in all stages and strengthen social alliances and networking;

(b) Environmental factors:

(i) Protect, restore and enhance ecosystems, watersheds, unstable slopes and coastal areas;

(ii) Engage in ecosystem-based risk management;

(iii) Commit to reducing contamination, improving waste management and reducing greenhouse gas emissions.

35. In light of these factors, a policy note[11] was produced as part of the indigenous knowledge workshop that took place in July 2008 at Kyoto University, Japan, to provide steps for mainstreaming indigenous knowledge into disaster risk reduction. The note proposed a seven-step path:

(a) The establishment of a resource group;

(b) Systematic documentation and research to establish guidelines and create a validated body of applicable knowledge — a database of indigenous knowledge practices is essential;

(c) Incorporation into formal and informal education;

(d) Engaging in policy advocacy;

(e) Enabling an environment that cuts across the techno-legal, socioeconomic and cultural regimes and permeates different areas of work;

(f) Identification of the right change agents (i.e. local leaders, lawmakers and administrators);

(g) Creation of special focus areas such as gender, urban risk, climate change adaptation and food security.

[16] See UNISDR, "How to Make Cities More Resilient: A Handbook for Local Government Leaders", Geneva, 2012.

36. Throughout the process of mainstreaming indigenous knowledge into the disaster risk reduction process, it is important to consider cultural aspects and the role of indigenous peoples' organizations, including traditional indigenous governments.

G. The 10 essentials for disaster resilience

37. To help local government leaders take steps to reduce their exposure to disaster risk, UNISDR has developed a 10-point checklist.[17] The 10 points are in line with the five priorities of the Hyogo Framework for Action 2005-2015 and most, if not all of the suggested steps can be used by indigenous peoples to improve their disaster resilience profile (see suggestions in bold after each essential point). The 10 points, as outlined by UNISDR, are:

(a) Put in place organization and coordination to understand and reduce disaster risk, based on participation of citizen groups and civil society. Build local alliances. Ensure that all departments understand their role in disaster risk reduction and preparedness. **Respect the institutions and organizations of indigenous peoples' when building alliances and promoting coordination**;

(b) Assign a budget for disaster risk reduction and provide incentives for homeowners, low-income families, communities, businesses and the public sector to invest in reducing the risks they face. **Design culturally appropriate incentives for indigenous communities and individuals and collective incentives**;

(c) Maintain up-to-date data on hazards and vulnerabilities, prepare risk assessments and use these as the basis for urban development plans and decisions. Ensure that this information and the plans for a city's resilience are readily available to the public and fully discussed with them. **Disaggregate data by sex and ethnicity. Ensure that plans are prepared in different languages and disseminated using traditional means of communication. Include non-traditional and cultural concerns in risk assessments**;

(d) Invest in and maintain critical infrastructure that reduces risk, such as flood drainage, adjusted where needed to cope with climate change. **Consider indigenous peoples' traditional infrastructure measures for risk reduction**;

(e) Assess the safety of all schools and health facilities and upgrade these as necessary;

(f) Apply and enforce realistic, risk compliant building regulations and land-use planning principles. Identify safe land for low-income citizens and upgrade informal settlements, wherever feasible. **Take into account indigenous peoples' land-use practices**;

(g) Ensure that education programmes and training on disaster risk reduction are in place in schools and local communities. **Take local languages into account. Involve indigenous leadership. Make full use of local indigenous institutions**;

(h) Protect ecosystems and natural buffers to mitigate floods, storm surges and other hazards to which your city may be vulnerable. Adapt to climate change by

[17] UNISDR, "The 10 Essentials for Making Cities Resilient" (http://www.unisdr.org/campaign/resilientcities/toolkit/essentials).

building on good risk reduction practices. **Climate adaptation plans and measures should utilize sources of traditional knowledge**;

(i) Install early warning systems and emergency management capacities in the city and hold regular public preparedness drills. **Warning systems should integrate traditional practices**;

(j) After any disaster, ensure that the needs of the survivors are placed at the centre of reconstruction, with support for them and their community organizations to design and help implement responses, including rebuilding homes and livelihoods. **Take into account traditional spiritual healing systems, traditional medicinal practices and similar traditional knowledge.**

38. As indigenous peoples seek to strengthen their resilience to disasters, it is important to consider the existing human resources and undertake an intercultural approach to implementing these steps, ensuring the participation of indigenous peoples throughout the process.

IV. Using indigenous knowledge to reduce disaster risk

A. What is indigenous knowledge?

39. Knowledge is not a static concept. It is created, discarded and improved upon all the time, through experience, interaction with our surroundings and through formal and informal education. Indigenous knowledge includes an understanding of the relationships between indigenous societies and nature, which have been tested by time and proven to be sustainable and successful in limiting the effects of hazards. This knowledge is often internalized within indigenous communities and has become part of their culture, although sometimes this is not evident to outsiders or even to the communities themselves.[10] This may be part of the challenge faced by policymakers in incorporating such practices into mainstream disaster risk reduction efforts through participative processes.

40. It can be difficult to draw a clear line between local and outside knowledge. Practices adapted from contact with exterior sources, if culturally integrated and tested over time, become indigenous in practice. In fact, the two most important elements of indigenous knowledge are its origin in the relationship between a community and a unique natural environment, and its relationship to a historic continuity in a specific location (developed over several generations). As noted in a 2008 study on indigenous knowledge, "The process of developing indigenous knowledge, whether incorporating outside knowledge or not, is accomplished solely by the community. A community holds a unique relationship with and an understanding of its environment and knows how to adapt any knowledge or experience to its specific context."[6]

41. Mainstream disaster management institutions have often systematically ignored indigenous knowledge, and many successful local practices have disappeared as a consequence of western influence. Several authors have argued that a dependence on foreign short-term humanitarian aid following disasters has resulted in the abandoning of coping practices, such as the stocking of famine foods. This has led, at times, to a reduced ability on the part of Governments and local communities to use their own resources and to implement, or maintain, positive

disaster risk reduction strategies. Furthermore, social, political, economic and cultural changes stemming from colonialism and globalization have led to the loss of indigenous knowledge and increased vulnerability in this area. In some small island developing States the change from subsistence farming to cash cropping, for example in Papua New Guinea and Vanuatu, has led to extensive land erosion, which has intensified the destruction caused by floods and landslides. In such instances, land may be cleared to make way for larger plantations, and stabilizing vegetation previously protected under indigenous law has been reviewed.[12] Moreover, broader access to formal education and exposure to other models, standards and values can lead to a breakdown of traditional communication networks, including the undermining of the importance of elders within society, as a result of which their knowledge dies with them.

42. Nonetheless, the value of indigenous knowledge for disaster risk reduction is increasingly being recognized in mainstream academia and research institutions, and in concrete policies through, for example, the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore established by the World Intellectual Property Organization in 2000.

B. Integrating modern science and indigenous knowledge

43. It is important to establish a balance between modern science and indigenous knowledge in order to reduce the risks and vulnerabilities such communities are exposed to. While clearly it is useful to take advantage of the scientific and technological tools available, their use must be carefully articulated, the capacities and resources available locally must be recognized and valued, and cultural imposition must be avoided.

44. The relationship between indigenous knowledge and the input of such knowledge on disaster risk reduction efforts is based on the close contact of indigenous peoples with their environment; indigenous communities have learned to read the signs in the sea, the rain, the wind, clouds, vegetation and wildlife to predict hazards. Traditional weather forecasting, which is used in agricultural planning, for example, includes the observation of the moon, the sun, the stars, animals and insects.

45. Direct experience with recurrent disasters has taught indigenous peoples and their communities about the duration, location, time, frequency, intensity and predictability of such events. The beginning and possible behaviour of a given hazard, such as the velocity of water flows or levels of rain, are learned from experience and transmitted from one generation to the next. These local, experiential, early warning systems are frequently credited with saving lives and property.

46. To successfully incorporate indigenous knowledge into disaster risk reduction policies, the compatibility of this set of practices with modern scientific methods, and the advantages of such a combination, must be acknowledged. The incorporation of such knowledge has already taken place in many traditional societies in the Asia-Pacific region. In December 2002, limited access to radio warning systems was complemented by oral dissemination and local coping strategies during the December 2002 cyclone in Solomon Islands, for example,[18]

[18] Anderson-Berry, L., Iroi, C., and Rangi, A., "The Environmental and Societal Impacts of Cyclone Zoe and the Effectiveness of the Tropical Cyclone Warning Systems in Tikopia and Anuta", report for the Centre for Disaster Studies, James Cook University, Cairns, Australia, 2003.

and the same system has been used in Miskitu indigenous communities living on the Caribbean coast of Nicaragua.

47. Formerly undervalued and ignored, the traditional knowledge and practices of indigenous peoples are now considered to be important and necessary contributions to the conservation of biodiversity, cultural and spiritual practices.[19] Yet this knowledge is under severe threat of being eroded, lost or misappropriated, a factor contributing to greater vulnerability, as demonstrated by the increasing levels of losses stemming from natural disasters in recent decades.[5] The Permanent Forum on Indigenous Issues cites several reasons for this:[19]

(a) Dispossession or forced removal from traditional lands and sacred sites has eroded the relationship between indigenous peoples and their environment. When forced to migrate and resettle in new environments, indigenous peoples find that their traditional knowledge and practices have to be adapted to new and often difficult circumstances;

(b) Traditional knowledge may sometimes be lost as the result of language extinction. Since the traditional knowledge accumulated by indigenous peoples is contained in languages that often have no script, this knowledge is passed on to other groups and new generations orally, making it difficult to retrieve once a language becomes extinct;

(c) Poverty is another threat to traditional knowledge. It is often the case that when people are poor, conservation is not a high priority, and they will take out of the environment whatever is needed for their survival;

(d) The misappropriation of indigenous knowledge in the form of biopiracy. As indigenous communities often inhabit areas with the highest biodiversity, they are coming under increasing pressure from biodiversity prospectors and corporations interested in privatizing and commercializing aspects of their biological knowledge.

C. The concept of transferable indigenous knowledge

48. The above-mentioned policy note of the indigenous knowledge workshop underlines the potential transferability of indigenous knowledge for the disaster risk reduction programme. It recognizes the following five thematic groups in which indigenous practices could be transferred to all communities living in similar contexts: mountain ecosystems; coastal zones; river basin management; water resource management; and housing.[11] Each of these areas of practice contains key characteristics and knowledge principles that may be transferable to other locations within the same geographic and climatic setting.

49. For example, the Disaster Reduction Hyperbase initiative is a component of the portfolio for disaster reduction proposed by the Government of Japan as part of the implementation of the Hyogo Framework for Action 2005-2015 (see http://drh.edm.bosai.go.jp/). The objective of this initiative, which is based in the Asian region, is the dissemination of disaster reduction technology and knowledge. The initiative defines the concept of transferable indigenous knowledge as the traditional art of disaster reduction indigenous to specific regions but having

[19] See United Nations, *State of the World's Indigenous Peoples*, New York, 2009.

potential to be applied to other regions and having time-tested reliability and it establishes a set of criteria for identifying transferable indigenous knowledge:

(a) Understandable to users;

(b) Implementable (usable, doable);

(c) Originating within communities, based on local needs, and specific to culture and context (environment and economy);

(d) Providing core knowledge with flexibility for local adaptation for implementation;

(e) Using local knowledge and skills, and materials based on local ecology;

(f) Proven to be time tested and useful in disasters;

(g) Applicable (or applied) in other communities or generations.

D. What has been done to date?

50. Since 2007, there have been a number of publications on the subject of the application of indigenous knowledge in disaster risk reduction efforts, several from the Asia-Pacific region. Much attention has been focused on the documentation and dissemination of indigenous knowledge in order to illustrate its value, including through the Disaster Reduction Hyperbase Initiative advanced by the Government of Japan and in *Indigenous Knowledge and Disaster Risk Reduction: Good Practices and Lessons Learned in the Asia-Pacific Region*, a publication of UNISDR in cooperation with Kyoto University and the European Union.

51. In 2007 and 2008, meetings on transferable indigenous knowledge were held in New Delhi where initial discussions took place on case-sharing and the establishment of an action agenda. In 2008, workshops took place in Beijing and Kyoto to discuss thematic indigenous knowledge sectors and other issues. Also in 2008, the third Asian Ministerial Conference on Disaster Risk Reduction, held in Malaysia, included a side-event on indigenous knowledge. Most recently, in 2012, at the fifth Asian Ministerial Conference on Disaster Risk Reduction in Yogyakarta, Indonesia, stakeholders participated in the consultations now under way worldwide to mainstream disaster risk reduction into the post-2015 development agenda.

52. These changes have slowly permeated at the national level, and results are beginning to emerge. Although the examples are still few, some national Governments have integrated the acknowledgement and importance of indigenous knowledge for disaster risk reduction into their strategies and frameworks for action. Several community-level projects have already been successfully undertaken with the support of the United Nations Development Programme, including a community-based disaster management project in Nepal, which was completed in 2011. These actions are all aimed to enhance stakeholder capacities at the community and district levels. Special attention was given to the combination of modern scientific and indigenous knowledge in disaster preparedness and mitigation efforts.

53. In the North Atlantic Autonomous Region in Nicaragua, the regional authorities, universities and local organizations conducted studies on adaptation measures after Hurricane Felix (2007) affected most of the Miskitu indigenous

communities living on the coast. The studies identified the relationship between traditional knowledge, spiritual practices and risk reduction measures.

54. Other interesting examples of community-level initiatives include the use of the keen observations and hereditary knowledge of the Moken sea-based nomads of the Surin Islands in Thailand and projects in partnership with non-governmental organizations in Viet Nam and Indonesia.

V. Opportunities: actions

55. Many communities have sufficient resources at their disposal to take action to minimize possible risks. In numerous existing community structures, public knowledge and experience and local capacities and skills are often sufficient to cope with disasters once the objectives are understood and the leadership is provided (given that it is the responsibility of each individual to protect himself or herself, as well as family, friends and neighbours). Examples of communities that are taking risk seriously include: Dhaka, a city of 14 million people, where aggressive mitigation programmes are helping to reduce the risk of earthquakes, cyclones and floods; Karlstaad, Sweden, which has operative, technical and planning measures in place to meet the threat of floods and minimize damage; and Aleppo, the Syrian Arab Republic, which has carried out risk assessments and classified by intensity those areas most at risk. In addition, Aleppo has prepared and continuously updates a database of institutional resources and capabilities of those involved in reducing risk. Models like this may have relevance if scaled to appropriate magnitude and adapted in culturally appropriate ways to indigenous communities.

56. Local citizens and populations play the primary role in responding to crises and emergencies. They are responsible for providing services and maintaining infrastructure (such as health, education, transport and water), which must be resilient to disasters. Strategies must be found and developed that empower communities and their citizens to understand the risks they face and to take action to reduce those risks in order to save lives and property.

57. There is a pressing need to create a campaign that will engage world leaders of indigenous communities interested in risk reduction and their non-indigenous counterparts in a dialogue aimed at understanding risks — those that are unique to indigenous peoples and those shared in common with vulnerable communities throughout the world. The desired outcome of the dialogue would be the production of effective strategies to reduce risk to disasters and of other events relevant to public health, including ways to remove challenges to their universal implementation.

VI. Conclusions

58. There is an urgent need to increase dialogue among Governments, institutions and indigenous peoples concerning the identification, incorporation and value of indigenous knowledge into all disaster risk reduction projects and programmes. In reference to the above discussion of the two types of indigenous knowledge, local and external, it is important that both be taken into account in adapting projects and programmes to the needs of particular communities. It is equally important that the decision-making power always stay in the hands of indigenous peoples, with special

attention to the challenges of local power relations, the possible exclusion of certain members of the community and the avoidance of cultural imposition. Priority must be given to working with and through local partners. In addition, since the danger of commercialization is always present, attention must be paid to avoiding any chance of exploitation during the transfer of indigenous knowledge.

59. The use of indigenous knowledge for disaster risk reduction is important because it represents self-reliance and sustainability. The strength of societies is based upon their ability to thrive with their own capacities and resources. Natural disasters do not exist, as affirmed in the International Strategy for Disaster Reduction, only natural hazards. Disasters happen when hazards strike unprepared societies. There is no better way of confronting a disaster than to prevent it from happening. Dependency has stemmed from intervention, and this has in turn provoked vulnerability. Indigenous knowledge not only has the potential but also the power to cope with disaster, as proven by its survival over thousands of years.

Respect for future generations

60. The constitution of the Iroquois Nations of North America is referred to as "The Great Binding Law". In it, there is a passage that calls for the consideration of future generations, which we might interpret as call to take action to reduce risk:

> "In all of your deliberations in the Confederate Council, in your efforts at law making, in all your official acts, self-interest shall be cast into oblivion. Cast not over your shoulder behind you the warnings of the nephews and nieces should they chide you for any error or wrong you may do, but return to the way of the Great Law, which is just and right. Look and listen for the welfare of the whole people and have always in view not only the present but also the coming generations, even those whose faces are yet beneath the surface of the ground — the unborn of the future Nation."

61. The Iroquois concept of making decisions with seven generations in mind has become a common theme of many North American indigenous communities, and some interpretations include seven previous as well as seven future generations. By respecting this precept we may honour our ancestors' knowledge by applying it, together with what we have learned in our own time, to make the future safer for generations to come.

VII. Recommendations

Moving forward: commitments and actions[20]

62. It is recommended that the international community, in particular at the fourth session of the Global Platform for Disaster Risk Reduction in 2013 and at the third World Conference on Disaster Reduction in 2015:

[20] Some of the above have been drawn or adapted from the Nayarit Outcome, Mexico, March 2011, MAF Bonn Declaration "10 action points", May 2010; summary from UCLG-A Marrakesh, December 2009.

(a) Advocate that international and national entities make resources available through coordination with local governments as a way of strengthening autonomy and capacities;

(b) Advocate that regional bodies and national Governments engage indigenous peoples and their communities in the formulation of disaster risk reduction policies, both to ensure cultural adaptation of mainstream strategies to better reach vulnerable communities and to empower those communities by taking advantage of their own knowledge and practices;

(c) Promote, at the regional and national levels, systematic research on and documentation of indigenous knowledge and practices for disaster risk reduction, studying the possibility of adapting successful practices to similar contexts;

(d) Work towards investing in disaster risk reduction in order to create resilience.

63. It is recommended that national policymakers:

(a) Understand and guarantee that civil society is seen as integral rather than external to local government, ensuring that disaster risk reduction planning at the local level is undertaken through participatory processes;

(b) Empower and guarantee that all members of civil society take ownership of the need to raise awareness surrounding the risks of disasters and work towards investing in disaster risk reduction in order to create resilience;

(c) Create a specialized working group for systematic research on and documentation of successful indigenous practices and knowledge to create a validated body of applicable knowledge;

(d) Incorporate the identification and use of successful indigenous knowledge and practices for disaster risk reduction, including non-formal means of dissemination, into official national disaster risk reduction policies and education plans;

64. It is recommended that indigenous community leaders:

(a) Take a leadership role in local level development and disaster resilience, and work with all stakeholders (locally and nationally);

(b) Work with city councils, municipal governments and others to promote budget increases aimed at assessing, capitalizing on and strengthening capacities for resilience at the local government level;

(c) Ensure that, at the community level, self-assessments of capacity and vulnerability are undertaken, with community participation, in order to identify new or recurrent hazards and successful past/present disaster risk reduction practices of local and/or external origin used to cope with them;

(d) Develop, through this process, integrated strategies that take advantage of both local knowledge and mainstream strategies that are better adapted to indigenous peoples' local concerns, capacities and resources of indigenous populations;

(e) Engage in dialogue with national and international institutions, platforms and frameworks to share knowledge and learn from the rapidly growing body of successful disaster risk reduction practice.